Remarks

Claims Status

Claims 1-5, 7-17, 19, 21, 27, and 29-30 are currently pending.
Claims 29 and 30 are new and fully supported by the current application.
Claim 28 is currently cancelled.
Claims 1, 17, 19 and 21 are currently amended.

Rejection Pursuant to 35 U.S.C.§103(a)

In the October 22, 2002 Office Action, claims 1-4, 7-17, 19, 21, 27 and 28 were rejected under 35 U.S.C.§ 103(a) as being unpatentable over the combination of U.S. Patent No. 5,487,356 (hereinafter referred to as "Li") and U.S. Patent No. 6,060,420 (hereinafter referred to as "Munakata").

Applicant respectfully traverses the rejection and requests reconsideration of all pending claims based on the ensuing remarks.

Li is directed to a chemical vapor deposition method of forming films showing a giant magnetoresistance, wherein such films are described as $(La_{1-x}A_x)MnO_3$, where $x + y = 1$. Li, further discloses that films having the formula $\mathbf{(La_{0.72}Ca_{0.25})MnO_3}$ are known in the art to exhibit a GMR effect and have been **previously deposited by PVD methods** (emphasis added).

Munakata teaches a method of making **powder** materials having a general formula $(A'_{1-x}A''_x)_{1-\alpha}(B'_{1-y}B''_y)O_{3-\delta}$ in which A' may be La, Nd, Gd and Y; A" may be Pr, Ce, Ba, Sr, or Ca, K or Pb; **B' and B" are different and selected from Mn, Co, Ti, Fe, Ni, Cu and Al;** $0 \leq \alpha < 0.2$; $0 \leq \delta \leq 1$; $0 < x < 1$ and $0 < y < 1$. The powders of Munakata et al., are made by a method comprising mixing powders of carbonates or hydroxides of the required metals; pulverizing the powders; combining the pulverized powder with citric acid and water; dehydrating the mixture to form a citrate composite; and calcining the citrate composite. Further, Munakata's materials are for use as catalysts in automotive related applications and electrode materials for sensor applications, and such materials improve the state of the art by providing "composite oxides controlling the solid phase reaction to the substrate and having improved durability and catalytic activity" (*See* column 16, lines 9-12).

The A-site defect materials of Munakata overcome the side effect of solid phase reactions occurring at an interface between a prior-art stoichiometric-perovskite oxide carried on an oxide-catalyst substrate, the solid phase reaction being caused by a high temperature degradation reaction (*See* column 1, lines 49-55).

Applicant's invention, as more particularly defined in amended claim 1, is directed to **a chemical vapor deposition (CVD) method of making A-site deficient manganate materials having, the general formula $La_xM_yMnO_3$, where M = Mg, Ca, Sr, or Ba, a Curie temperature that is between 273 K and 334 K, and $0.5 < (x+y) < 0.9$.** The amended claim 1 explicitly requires that the CVD films have a Curie temperature that is between 273 K and 334 K.

When determining differences between the prior art and the claimed invention, it is necessary for the Examiner to consider applicant's invention as a whole, which provides a **CVD method** of forming magnetoresistive materials having the general formula $La_xM_yMnO_3$, where M = Mg, Ca, Sr, or Ba, and $0.5 < (x+y) < 0.9$ and Curie temperatures that are at or above room temperature. Applicant's invention solves a need in the art for magnetoresistive materials having room temperature, Curie temperatures, and **a method of making such materials.**

Primary reference Li, does not solve such a problem, nor does Li suggest, understand or expect that an A-site deficient thin film having the composition $La_xM_yMnO_3$, where M = Mg, Ca, Sr, or Ba, and $0.5 < (x+y) < 0.9$, would produce magnetoresistive films having Curie temperatures at, or above room temperature.

Moreover, Li and Munakata combined provide no derivative basis for the applicant's claimed invention, since Li is broadly directed to a method of making metal oxides of the formula $La_xA_{1-x}MnO_3$, wherein the corresponding value of (x + y) is 1 and Munakata is broadly directed to A-site defect perovskite films having a generic formula $A_{1-a}BO_{3-\delta}$ for use in automotive related catalysts and sensor electrodes.

In Paragraph 20 of the October 22, 2002 Office Action the Examiner states that the motivation to combine Li and Munakata is "clear and explicit" and continues by providing specific examples from the references as basis, including:

> **Munakata et al. is drawn to making A-site deficient manganate films having a specific stoichiometry (Abstract and Col. 3)**
>
> **Li et al. teaches that manganate films can be successfully deposited by liquid source delivery CVD (Abstract).**
>
> **Li et al. also teaches that benefits of this CVD method include (1) good control of key variables such as film thickness and film stoichiometry, (2) coating of a wide variety of substrate geometries, and (3) the ability to be readily scaled up to production runs (Col. 2, lines 38-65).**

However, applicant further notes Li's teaching at Column 3, lines 11-14:

> **Premature gas phase reactions leading to particulate formation must not occur, nor should the source reagent decompose in the lines before reaching the reactor deposition chamber.**

According to MPEP 2143.01 **Suggestion or Motivation to Modify the References**

> **If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification.**

Accordingly, if the Examiner's assertion, that the motivation to combine Li and Munakata is in fact "clear and explicit", then one could theoretically modify the CVD process of Li to arrive at the catalysts taught by Munakata.

At column 13, lines 60-65, Munakata teaches "the conventional perovskite type composite oxide is highly dispersed onto a surface of zirconia as a substrate..". As a dispersion includes a particulate component (*See* Appendix A, where applicant provides a copy of the definition of dispersion as defined in **McGraw-Hill Dictionary of Scientific and Technical Terms, Fourth Edition**) and as CVD necessarily requires coatings and films to be particle free, as taught by Li, the modification of Munakata's dispersion to a uniform coating or film, would render the catalysts taught my Munakata not suitable for their intended purpose.

Moreover, United States patent number 6,372,688, (a copy of which is enclosed herein in Appendix B) from which an excerpt is provided below, provides further evidence and support for applicant's reasoned statement, rendering the catalysts taught by Munakata not suitable for their intended purpose if deposited by a particle free chemical vapor deposition process:

A third aspect of the present invention is a process optimum for producing the aforementioned catalysts, and is characterized in that it is a process for producing a *catalyst* for purifying an *exhaust gas*, comprising the steps of:

mixing a solution, in which an alkoxide containing an alkaline-earth metal and a platinum compound are solved, with composite oxide support particles having a spinel structure expressed by MAl_2O_4 in which M is an alkaline-earth metal, thereby hydrolyzing the alkoxide; and

burning the resulting hydrolyzed products, thereby forming a platinum structural layer on a surface of the composite oxide support particles, the platinum structural layer including a matrix composed mainly of an alkaline-earth metal oxide in which platinum clusters are dispersed uniformly.

Consequently, there is no motivation to combine the Li and Munakata references and the instant § 103(a) rejection is moot in light of same and applicant respectfully requests the withdrawal of such rejection and reconsideration of claims 1-5, 7-17, 19, 21, and 27.

Petition Under 37 CFR 1.136 for Three Month Extension of Time

Petition hereby is made under the provisions of 37 CFR 1.136 for a three month extension of the term for response to the October 22, 2002 Office Action, extending the term for response to April 22, 2003.

Fees Due and Payable

Amendment of claims herein, includes the addition of two dependent claims, bringing the total number of currently pending claims to 21, 1 of which is independent. As applicant had originally paid for 22 claims, of which 1 was independent, no net fee is due in connection with the addition of claims.

In connection with applicant's Petition Under 37 CFR 1.136 for Three Month Extension of Time, a fee of $930 as specified in 37 CFR 1.17(a)(3), is hereby authorized to be deducted from the Deposit Account No. 50-0860 in the name of applicant, Advanced Technology Materials, Inc., 7 Commerce Drive, Danbury, CT 06810.

Should the Office determine any additional fees are due in connection with the entry of this amendment, the Office is hereby authorized to deduct such fee from the above-identified deposit account.

Conclusion

With this amendment and addition of dependent claims 29 and 30, all issues of allowability of the instant application are respectfully submitted to be resolved favorably to applicant.

It therefore is requested that the Examiner responsively issue a Notice of Allowability for claims 1-5, 7-17, 19, 21, and 28-30, so that the application can be passed to issue at an early date.

If any issues remain, incident to formal allowance of the application, the Examiner is requested to contact the undersigned agent at (203) 794-1100 ext 4184 to resolve same.

Respectfully submitted,

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